



SCHOOL DISTRICT OF MONROE

Preparing for the Future, One Child at a Time

Civil Engineering & Architecture

Course Description:

The curriculum for this course is a high school honors level specialization course in the national **Project Lead the Way (PLTW) Engineering Program**, and is developed in alignment with the [Wisconsin Standards for Technology and Engineering](#). This elective course is a 2-trimester course in which students are introduced to the important aspects of building and site design and development. Students will apply math, science, and standard engineering practices to design both residential and commercial projects, and will document their work using the current industry standard 3D architectural design software - AutoDesk Revit. Utilizing the activity-project-problem-based (APB) teaching and learning pedagogy, students will progress from completing structured activities to solving open-ended projects and problems that require them to develop planning, documentation, communication, and other professional skills. The information in this course overview outlines what students should understand and be able to do by the end of the year.

Mastery Standards:

Students will be able to select and use architecture and construction technologies (AC1).

Students will analyze construction requirements, materials, structures, techniques and maintenance (AC1.a).

Students will apply measurement systems in the planning and layout process used in the construction industry (AC1.b).

Students will demonstrate the variety of building phases, systems and techniques used in architecture and construction (AC1.g).

Students will be able to analyze graphic communications in an ever-increasing technological world (ICT1.c).

Unit	Description of Unit and Learning Targets
<p>Unit Title: 1</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none">• How has our world been improved through thoughtful building design and development?	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none">• I can explain how past accomplishments in civil engineering and architecture have paved the way for the design and developments of methods that we practice today.• I can explain the duties and responsibilities of civil engineers and architects, and what the educational and accreditation requirements are to become a professional architect or engineer.
<p>Unit Title: 2</p> <p><u>Essential Questions:</u></p> <ul style="list-style-type: none">• What design elements and principles constitute good residential and commercial design?	<p>Students will...</p> <p><u>Learning Targets:</u></p> <ul style="list-style-type: none">• I can identify and apply good design elements and principles used in civil engineering and architectural design.• I can identify and apply math, science, and standard architectural and engineering practices to design both residential and commercial projects; including: building components and materials, wood-framed construction techniques and practices, sustainable energy design practices, commercial building systems and structures, services and utilities, and site considerations.• I can demonstrate my skills in using 2D and 3D building information modeling software to document and communicate my design solutions.